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| 09/695,812 | 10/24/2000 | Galen C. Hunt | MS1-547US | 4273 |

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| EXAMINER | |
|---|---|
| KANG, PAUL H | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/695,812 | HUNT ET AL. | |
| | Examiner | Art Unit | |
| | Paul H. Kang | 2144 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *29 August 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,3-25 and 73-76* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-25 and 73-76* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 October 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/24/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Notice of Allowance Vacated*

1. Applicant is advised that the Notice of Allowance mailed is vacated. If the issue fee has already been paid, applicant may request a refund or request that the fee be credited to a deposit account. However, applicant may wait until the application is either found allowable or held abandoned. If allowed, upon receipt of a new Notice of Allowance, applicant may request that the previously submitted issue fee be applied. If abandoned, applicant may request refund or credit to a specified Deposit Account.

2. The indicated allowability of claims 1, 3-25 and 73-77 is withdrawn in view of the newly discovered reference to Tang, et al., US Pat. App. Pub. No. US 2003/0165140 A1. Rejections based on the newly cited reference(s) follow.

### *Claim Rejections - 35 USC § 101*

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1, 2-14 and 73-76 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claims are drawn to "a multi-tiered management architecture" and "a multi-tiered computer management architecture" which amount to software per se with no tangible result.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

**6. Claims 1-8, 10-12, 14-19, 21-23, 25 and 73-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,801,937 to Novaes et al in view of US Patent App. No. US 2003/0165140 A1 to Tang, et al..**

7. As to claims 1, 15 and 77, Novaes teaches the invention substantially as claimed. Novaes teaches a multi-tiered management architecture comprising (Novaes, Fig 1): an application development tier "Resource Manager Component" at which applications are developed for execution on one or more computers (Novaes, Col 6, lines 30-41); an application operations tier "Group Service Component" at which execution of the applications is managed (Novaes, Col 6, lines 19-29).

However, Novaes does not explicitly teach a cluster operations tier to manage the operation of the computers without concern for what applications are executing on the one or more computers. Novaes teach about a distributed system in which resources (clusters) are shared among a group of entities (Novaes, Col 1, lines 48-60).

Tang teaches a cluster operations tier to manage the operation of the computers without concern for what applications are executing on the one or more computers (the system manages

the data transfer over the VLAN without concern for what applications are executing; See Tang, ¶¶ 0024-0026). The system of Tang also teaches wherein the cluster operations tier is responsible for securing a computer cluster boundary based on network filters received from a cluster operation tier console and a remote console giving precedence to those from the cluster operation tier console over the remote console to prevent a plurality of other computers that are not part of the computer cluster from accessing the one or more computers in the computer cluster, such that network filters from the remote consoles cannot enable communications between applications on server nodes across cluster boundaries that have been defined by the network filters received from the one or more cluster operations management consoles (VLAN boundaries are created by the network management. Remote devices may also create a filter for sub-regions or specific multicast group addresses, however, only to sub-regions or specific multicast group addresses within the specified VLAN, i.e. the newly created filter cannot traverse outside the designated VLAN but is a filter within said VLAN; See Tang, ¶¶ 0102-0104).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to apply the technique of using the cluster operations tier to manage data transfer as taught by Tang, to improve the computer architecture of Novaes for the predictable result of enabling a consolidated network management architecture. The various tiers, and the technique of combining the various tiers, was recognized as part of the ordinary capabilities of one skilled in the art.

8. In claim 3, Novaes-Tang teaches a management architecture as recited in claim 1, wherein the application operations tier is responsible for securing sub-boundaries within the

computer cluster boundary to restrict communication between computers within the computer cluster (Novaes Col 6, lines 19-29).

9. In claim 4, Novaes-Tang teaches a management architecture as recited in claim 1 wherein the application operations tier is implemented at an application operations management console at a location remote from the one or more computers (Novaes, Fig 4 and Col 4, lines 14-25).

10. In claim 5, Novaes-Tang teaches a management architecture as recited in claim 1, wherein the cluster operations tier is implemented at a cluster operations management console located at the same location as the one or more computers (Novaes, Fig 6 and Col 4, lines 14-25).

11. In claim 6, Novaes-Tang teaches a management architecture as recited in claim 1, wherein the application operations tier monitors execution of application processes on the one or more computers and detects failures of the application processes (Novaes Col 6, lines 25-30).

12. In claim 7, Novaes-Tang teaches a management architecture as recited in claim 1, wherein the application operations tier takes corrective action in response to a software failure on one of the computers (Novaes Col 6, lines 25-30).

13. In claim 8, Novaes-Tang teaches a management architecture as recited in claim 7, wherein the corrective action comprises re-booting the computer (Novaes Col 5, lines 40-50) (Novaes Col 7, lines 50-65) (Novaes Col 17, lines 30-40). In the situation of a software failure (lock up), the node has to be reconfigured, which is accomplished by running the bootstrap program to accomplish the task. This process is well known in the art as a software watchdog program, which requires the rebooting of the hardware in question.

14. In claim 10, Novaes-Tang teaches a management architecture as recited in claim 1, wherein the cluster operations tier monitors hardware operation of the one or more computers and detects failures of the hardware (Novaes Col 6, lines 5-20) (Novaes Col 8, lines 15-20).

15. In claim 11, Novaes-Tang teaches a management architecture as recited in claim 1, wherein the cluster operations tier takes corrective action in response to a hardware failure of one of the computers (Novaes Cot 6, lines 25-30) (Novaes Cot 7, lines 55-65). Software depends on hardware, therefore a failure in hardware result in a failure in software. The recovery process of the Group Service component provides the corrective action need to recover from a hardware failure.

16. In claim 12, Novaes-Tang teaches a management architecture as recited in claim 11, wherein the corrective action comprises re-booting the computer (Novaes Col 5, lines 40-50) (Novaes Col 7, lines 55-65) (Novaes Col 17, lines 30-40).

17. In claim 14, Novaes-Tang teaches a management architecture as recited in claim 11, wherein the one or more computers are situated in one or more clusters at a co-location facility (Novaes, Fig 1).

18. As per claim 16, Novaes-Tang teaches a system further comprising a different cluster operations management console corresponding to each of the plurality of server node clusters (Novaes, Fig. 2 and col. 5, lines 15-25).

19. As per claim 17, Novaes-Tang teaches a system wherein each of the plurality of server node clusters includes, as its server nodes, a plurality of server computers (Novaes, Fig. 1, col. 3, lines 60-67, col. 13, lines 45-60).

20. As per claim 18, Novaes-Tang teaches a system wherein the hardware operations include one or more of: mass storage device operation, memory device operation, and network interface operation, and processor operation (Novaes, Fig. 11, col. 3, lines 35-45).

21. As per claim 19, Novaes-Tang teaches a system wherein each management console is configured to receive node control commands from an application operations management console located remotely from the co-location facility (Novaes, Fig. 4, col. 4, lines 10-25, col. 5, lines 15-25).

22. As per claim 21, Novaes-Tang teaches a system further comprising a data transport medium coupled to each server node in the plurality of server node clusters via which each node can access an external network (Novaes, col. 3, line 65 – col. 4, line 10).

23. As per claim 22, Novaes-Tang teaches a system wherein the external network comprises the Internet (Novaes, col. 4, lines 55-65).

24. As per claim 23, Novaes-Tang teaches a system wherein each server node in each server node cluster is configured with the boundary of the server node cluster (Novaes, col. 4, lines 55-65).

25. As per claim 25, Novaes-Tang teaches a system wherein one or more of the server nodes in a server node cluster are accessed by the user from the co-location facility (Novaes, col. 3, lines 35-50)

26. In claim 73, Novaes-Tang teaches a multi-tiered computer management architecture comprising (Novaes, Fig 4 and Col 4, lines 10-25):

a first tier corresponding to a computer (Novaes, Fig 4, operating system instance);

a second tier, implemented by a cluster operations management console and a remote console that establishes network traffic boundaries based on network filters, giving preference to those from the cluster operations management console over that from the remote console, corresponding to a hardware operator that is to manage hardware operations of the computer but

not application software operations of the computer (VLAN boundaries are created by the network management. Remote devices may also create a filter for sub-regions or specific multicast group addresses, however, only to sub-regions or specific multicast group addresses within the specified VLAN, i.e. the newly created filter cannot traverse outside the designated VLAN but is a filter within said VLAN; See Tang, ¶¶ 0102-0104; See also Novaes, Fig 4, DCM Process);

a third tier, implemented by an application operations management console, corresponding to a software operator that is to manage software operations of the computer but not hardware operations of the computer (Novaes, Fig 4, Group Service Process; col. 6, lines 25-30); and

a fourth tier corresponding to the owner or lessee, wherein the owner or lessee operates in the fourth tier except when revoking the rights of the hardware operator or software operator (Novaes, Fig 4, Resource Manager Process) (Covered in claim 1).

27. In claim 74, Novaes-Tang teaches an architecture as recited in claim 73, wherein the cluster operations management console at a location remote from the computer (Novaes Col 4, lines 10-25). The modularity of the approach allows the each of the tiers to operate without the restriction of location.

28. In claim 75, Novaes-Tang teaches a architecture as recited in claim 73, wherein the application operations management console at a location remote from the computer (Novaes Col

4, lines 10-25). The modularity of the approach allows the each of the tiers to operate without the restriction of location.

**29. Claims 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Novaes-Tang, in view of US 6,801,937 to Hipp.**

30. In claim 9, Novaes-Tang teaches all the limitation but does not explicitly teach notifying an administrator that a failure has occurred.

In the same field of endeavor, Hipp teaches a management architecture "remote management system 70" as recited in claim 7, wherein the corrective action comprises notifying "sound an alarm" an administrator of the failure (Hipp, Col 22; lines 55-65).

The administrator of a network is most knowledgeable about the operation of a network that he or she is in charge of, and in the case of a failure, possesses the skill that is needed to fix the problem. Down time in a network has to be kept to a minimum and in order to satisfy this requirement it is wise to notify the person that is most knowledgeable and capable of fixing the problem.

It would have been obvious at the time of the invention for some one of ordinary skill to send a notification of a failure to an administrator in order that the problem can be remedy in the shortest time possible.

31. In claim 13, Novaes-Tang teaches a management architecture as recited in claim 11, wherein the corrective action comprises notifying a co-location facility administrator (Covered in claim 9).

**32. Claims 20, 24 and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Novaes-Tang-Hipp, and further in view of US 6,529,953 to Van Renesse.**

33. In claim 20, Novaes-Tang-Hipp teaches all the limitation but does not explicitly teach using private and public key to support tunneling.

Van Renesse teaches about a system as recited in claim 19, wherein each node in each node cluster "all the node that stores MIBs" is configured with a private key that allows the node to decrypt communications that are received, in a form encrypted using a public key, from the application operations management console "authorized nodes that maintain the MIB" associated with the customer that corresponds to the node cluster (Van Renesse, Col 7, lines 34-45 and Col 7, lines 50-60).

In applicant invention different clusters belonging to different users are located on the same physical storage. To prevent the unauthorized use of a cluster out side the assigned group, a system of tunneling using private and public keys for encryption and decryption is used. Unauthorized user if given access can corrupt the clusters and thus render it useless. Like the applicant, Van Renesse discloses the need for security to prevent important storage spaces (MIB storages like applicant's clusters) from being access by interloper. The success in maintaining group state of Novaes-Tang-Hipp invention is hinged on the security that only the members of

the group in question are allowed to make changes. Without this security boundary, outside entities would modify the group state, which will cause the system to crash. By adding, the additional security of public/private keys, one is better able to guarantee that only authorized members are allowed to do these critical changes.

It would have been obvious at the time of the invention for some of ordinary skill to use private and public keys system to protect the group state of Novaes-Tang-Hipp system from being accessed and corrupted by unauthorized users.

34. In claim 24, Novaes-Tang-Hipp teach a system as recited in claim 15, wherein each node in each node cluster is configured with a private key that allows the node to decrypt communications that are received in a form encrypted using a public key, from the cluster operations management console. (covered in claim 20).

35. In claim 76, Novaes-Tang-Hipp teach an architecture as recited in claim 73, further comprising using a plurality key pairs, each key pair including a private key and a public key, to securely communicate between the computer and a management device corresponding to the hardware operator, as well as between the computer and a management device corresponding to the software operator(Covered in claim 1) (covered in claim 20).

***Response to Arguments***

36. Applicant's arguments with respect to claims 1, 3-25 and 74-77 have been considered but are moot in view of the new ground(s) of rejection. The new grounds of rejection teaches the

previously amended feature of securing a computer cluster boundary based on network filters from a cluter operations tier console and a remote console giving precedence to those from the cluster operations tier console.

***Conclusion***

37. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul H. Kang whose telephone number is (571) 272-3882. The examiner can normally be reached on IFP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Vaughn can be reached on (571) 272-3922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Paul H Kang/
Primary Examiner
Art Unit 2144